United States
CONSUMER PRODUCT SAFETY COMMISSION
Washington, D.C. 20207

MEMORANDUM

DATE: October 23, 2001

TO : HS

Through: Todd A. Stevenson, Acting Secretary, OS

FROM : Martha A. Kosh, OS

SUBJECT: Draft Sampling Protocols for Chromated Copper Arsenate (CCA) Pressure-Treated Playground Equipment and Related Soil; Notice of Availability

ATTACHED ARE COMMENTS ON THE **CA 02-1**

COMMENT	DATE	SIGNED BY	AFFILIATION
CA 02-1	9/27/01	Jack Eslien EslieJ@mail01.dnr.state.wi.us	
CA 02-2	10/18/01	Ligia M Applegate Risk Assessment	US Environmental Protection Agency Room 308 1921 Jefferson Davis Highway, Crystal Mall II Building Arlington, VA 2215
CA 02-3	10/22/01	George Parris Ph.D., Director of Environmental and Regulatory Affairs	American Wood Preservers Institute 2750 Prosperity Ave. Suite 550 Fairfax, VA 22031
CA 02-4	10/22/01	Hasmukh Shah Manager	American Chemistry Council Arsenical Wood Preservatives Task Force 1300 Wilson Blvd Arlington, VA 22209

Stevenson, Todd A.

From: Bittner, Patricia
Sent: Thursday, September 27, 2001 12:46 PM
To: Hammond, Rocky X.; Stevenson, Todd A.
Subject: FW: Sampling Protocols for Chromium Copper Arsenates in Playground Eq uipment FRL-6802-8

Could all please log this in as an official comment for the current FR notice on playground protocol? Thanks.

-----Original Message-----
From: Eslien, Jack J [mailto:EslieJ@mail01.dnr.state.wi.us]
Sent: Monday, September 24, 2001 9:52 AM
To: 'pbittner@cpsc.gov'; 'cook.norm@epa.gov'
Subject: Sampling Protocols for Chromium Copper Arsenates in Playground Eq uipment FRL-6802-8

I think the agencies invoved in this proposed soil sampling for CCA residuals should be correlating their investigation with hair samples collected from childred known to play on this equipment. Testing heavy metals in hair is inexpensive and offers a fairly accurate map of exposure.

Jack Eslien
WDNR Hydrogeologist

existence of dependable playground structure information a selection criterion for sites to be sampled.

3. The protocol does not explain how the data on the speciation of arsenic and chromium in the pilot study will be interpreted. That is, it is unclear what kind of result from the pilot study would lead the Agency to include speciation of arsenic and chromium in the field study. As a result, it is difficult to judge whether the number of samples in the pilot study for which speciation will be obtained is sufficient. Our impression is that the number of samples is probably too small (a total of three samples of soil and only two of buffering material) regardless of the information sought. We would suggest increasing the percentage of samples from which speciation data is obtained. Different regions have different climatic conditions which may influence the form of arsenic present.

4. The document addresses sampling, analytical techniques and validation for total arsenic but does not address those topics for the speciation of arsenic. Specifically, attention needs to be paid to validating collection and analytical preparatory techniques to ensure that changes in oxidation states do not occur as a result of those activities. How that validation will be performed is unknown, especially for preparation techniques. For example, will a method such as Method 1632 be validated for soil samples (Method 1632 is a validated technique only for waters and tissues currently). Are the validation methods for arsenic speciation to include validation of sample collection and storage requirements necessary to preserve the arsenic species?

5. We strongly suggest that soil fortification levels relative to soil concentrations be specified for method validation exercises (this applies to total analysis and speciation methods). One of the problems we have observed with method demonstration at some laboratories is that studies are not performed at realistic levels.

6. The valence state for chromium (i.e., hexavalent versus trivalent) has important implications in terms of toxic potential. Currently, a similar distinction is not made between trivalent and pentavalent arsenic. As such, it is not clear how arsenic speciation data would be used in an assessment of human health risks.

7. Our general impression is that the number of soil/buffering material samples to be collected is rather low, 10 per playground. If speciation is not required, measurement of arsenic, chromium, and copper in soil samples is inexpensive. Since most of the costs of the sampling effort will be in mobilization, we suspect that the number of samples per playground could be doubled without substantially increasing the cost of the overall sampling program. More samples around and away from the CCA structure would provide better characterization of each playground site.

8. There is also a lack of replicate samples.

9. For assessment and delineation, deeper soil samples will be needed to determine vertical extent of contamination.

10. It is not clear whether the physical/chemical properties of the soil (grain size, TOC, carbonate content, etc.) will be determined for each site.

11. At some playgrounds, the buffering materials are separated from soil by a permeable geomembrane. The main purpose of this membrane is to keep the buffering materials separate, in place and visible when additional material is needed. If observed, will this geomembrane be penetrated?.

We have also reviewed at EPA's request the preliminary draft protocol "*Sampling Chromated Copper Arsenate (CCA) 'Pressure' Treated Wood Playground Equipment For Dislodgeable Residues of Arsenic, Chromium, and Copper*" prepared by the U.S. Consumer Product Safety Commission (CPSC). This protocol was generated to address data gaps that contribute to uncertainty in the evaluation of the hazard to children from exposure to CCA-treated wood playground structures, and is part of a joint effort between the USEPA's Office of Pesticide Programs (OPP) and the CPSC. In their September, 2001 draft document, "*Children's Exposure to CCA-Treated Wood Playground Equipment and CCA-Contaminated Soil*," OPP states that the objective of such sampling activities is to document "potential dislodgeable and soil residues of arsenic, chromium, (and copper) which may occur on CCA-treated playground equipment," and indicates that it should include "Collection of a specific number of wood wipe (cloth and hand) samples and soil samples at each site." The protocol under review provides a sound approach for conducting reproducible and systematic sampling of dislodgeable residues from in-use and new playground structures, as well as for obtaining data on several variables that might affect residue levels (e.g., weather conditions, age of the wood structure, sealing and other maintenance practices). Limited exposure information will also be obtained as part of this sampling effort.

After reviewing this document, we offer the following comments and suggestions:

1. The document states that local authorities "(school boards, county and state park departments, etc.)" will be contacted to obtain permission to sample playground structures. Although not specifically mentioned, we would strongly encourage inclusion of CCA-treated play structures in pre-school and day care facilities. Such structures are arguably most relevant to the population specifically targeted for the assessment of hazards (children ages 1 to 6 years). This is also the type of environment where play structures may get the most frequent and intensive use, which will be important to document during the collection of playground usage data (see page 12 of the protocol).

2. The September, 2001 OPP draft document cited above justifies the need for developing this protocol in order to collect cloth and hand wipe samples of dislodgeable residues on CCA-treated wood. The current draft sampling protocol would collect data using cloth wipe samples only. In our opinion, a significant uncertainty in the assessment of exposure from direct contact with wood is the extent to which measurement of dislodgeable residues with cloth wipe samples is representative of transfer to hands under conditions of normal activity. This uncertainty could be addressed to some extent by including a carefully controlled study comparing transfer to hands vs. Transfer to cloth wipes.

3. Playground structure data (e.g., type of wood, relative age of the structure, CCA treatment level, use of paints and sealants; see page 11 of the protocol) will be essential in trying to understand factors that influence the levels of dislodgeable residues on CCA-treated wood structures. Undoubtedly, the availability of reliable information on structures will vary considerably from site to site. In our opinion, the inclusion of samples from sites with unreliable estimates for these characteristics greatly compromises the utility of the data set. Accordingly, we recommend that the availability of dependable playground structure information be used as a selection criterion for sites within a region.

4. The proposed methodologies are designed to sample dislodgeable residues from horizontal and vertical flat surfaces. However, some playground structures have round poles for structural support that can be accessible for direct contact by children. It is not clear to us if some adaptation to the methodology will be introduced to sample these poles, or if they will be considered during the proposed sampling effort. This should be clearly addressed in the protocol.

We hope these comments are helpful. Please do not hesitate to contact Ligia Mora-Applegate at 850 488 0783 if you have any questions regarding these matters.

Sincerely,

Ligia Mora-Applegate
Risk assessment
Bureau of Waste Cleanup

cc: John Ruddell
Doug Jones
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Leslie Palmer

3

American Wood Preservers Institute

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October 22, 2001

Consumer Products Safety Commission
Office of the Secretary
Washington, DC 20207-0001

US Environmental Protection Agency
Office of Pesticide Programs
(7502C)
1200 Pennsylvania Ave. NW
Washington, DC 20460

RE: *Federal Register* 66(183): 48428-48430, September 20, 2001

Subject: Comments on CPSC and EPA Sampling and Analysis Protocols

Dear CPSC and EPA:

We have elected to comment on both your protocols in a single document. Our comments are attached.

Sincerely,

George E. Parris, Ph.D.
Director of Environmental and Regulatory Affairs
American Wood Preservers Institute

Comments
on
CPSC and EPA
Sampling and Analysis Protocols for Playgrounds
(*Federal Register* 66(183): 48428-48430, September 20, 2001)

General Comments:

The ambitious program as proposed by the CPSC and EPA will, regrettably, not bring us any closer to an accurate risk assessment than we are today.

The primary uncertainties in the numerous exposure assessments reported to date on CCA-treated playground equipment have to do with estimating the actual ingestion of arsenic by children. Although the CPSC and EPA protocols will generate a substantial new base of data obtained under consistent conditions, it will not answer the key questions. Specifically, how will the Agencies translate the soil and wipe-test data into actual exposures?

In particular, it appears that the estimates used for the *frequency* and *extent* (surface area) of mouthing of hands by children used in the various exposure and risk assessments is substantial overstated. Informal observations by AWPI staff of their own children playing on preserved wood and other playground equipment suggest that those children that are allowed to range freely over the equipment and soil (typically over 2 years old) generally do not mouth any parts of their hands during a typical 1-2 hour play session. On the other hand, those children who do mouth their hands frequently (typically less than 2 years old) are generally not mobile or at least are continuously attended by an adult who prevents mouthing soiled hands on general hygiene grounds. Thus, we would recommend that the CPSC/EPA invest in a systematic survey of children at playgrounds to determine the *frequency and extent of mouthing by specific age and exposure groups*.

A separate issue that is noted in the first comment on the EPA protocol below is that some buffer materials have a secondary purpose of slowing the rate at which children become soiled during play. For example, the buffer may be composed of large particle-size materials that do not adhere to the skin or clothing. Thus, some attention should be given to the period of time required to achieve skin loading during the normal play period, most models seem to assume that the skin is immediately, uniformly and continuously loaded with soil *etc.* during play. In fact, many children complete their play event without becoming uniformly soiled.

The data previously presented seems to lump all children in ages 1-6 years together such that we have an impression of children actively and extensively mouthing their hands throughout their childhood (1-16 years of age). We are skeptical of existing videotapes because they may be misinterpreted or edited to misrepresent the actual events.

Comments on Soil/Buffer sampling (EPA Protocol):

(1) The sampling protocol for soils as proposed will generate data with dubious relevance to the issue of exposure of children. To be relevant, the sampling should focus on the *top 3 inches* of (either) soil or buffer materials that the children are likely to be exposed to. Samples of soil buried under several inches of buffer are of little relevance to children's exposure, although a few samples might be useful to prove that the pesticide residues are not significantly contaminating the soil and are of no threat to potable aquifers. Although only that fraction of soil or buffer material that is small enough to adhere to the skin is relevant for sampling, it should be noted that large pieces of buffer material may restrict the effective area of hand (skin) coverage. The result would be a delay in the accumulation of soil on the skin such that extended periods (probably longer than the average play period) of time would be required to receive a full loading of the skin. This is consistent with the secondary purpose of buffer material (*i.e.*, to prevent children from becoming soiled during normal play). [Note that the primary purpose of buffer material is to provide a soft landing for falls.] Measurement of the ratio of readily available arsenic in bulk buffer material and in fine (skin-adhering) soil/buffer materials would give an idea of the range of skin loading that is possible during the play event. [Obviously, the arsenic content of large, inert buffer materials is not relevant.] For example, one might compare the amount of arsenic picked up by pressing a palm-size blotter onto buffer material and compare this to the arsenic that can be picked up by pressing the same blotter into the skin-adhering particles separated from soil/buffer material. The question then becomes, how much playtime is required to reach the latter condition, and is that longer than the normal play interval.

(2) The soil sampling protocol as proposed will vastly over-weight areas of known (relatively) high residue concentrations (many of which may be inaccessible to children). It is well-known that within a foot or so of support posts and poles, pesticide residues accumulated adjacent to the wood especially in the near-surface soil. This is a radial distribution (more than an inside/outside phenomenon) apparently controlled by rainwater running down the post and then spreading out on the surface from the post before evaporating or soaking in. Thus, we suggest that the samples be collected from the top 3 inches of soil integrated from 1 to 18 inches from the support post. These data are relevant for establishing the *upper limit* on the soil contamination, *not the average*.

In order to obtain an average for exposure assessment, the samples collected near support post as described above should be weighted as follows:

> The concentration in the integrated sample (1-18 inches around the post) should be adjusted by counting the number of post in the playground to which children actually have access and multiplying that number by about 10-sq. feet (the area around the post) divided by the total area of the playground:
>
> Playground average surface concentration =

[near-post concentration] X [(# of assessable supports) X (10 sq.-ft)] / [play area]

+ [Average assessable play area concentration X (play area)]/ [play area]

Note that a typical play area is expected to be over 500-sq feet and may be over 10,000-sq-ft.

This weighting factor should be accepted *before* any data are collected, because once the data are collected, the tendency will be to average all the numbers without weighting. (We suspect that this was one of the major flaws in the work done by Dr. Stilwell (1997, *Environ Contam Toxicol*) as his averages were strongly influenced by numbers at the upper end of his range. That is, the upper end of his range was frequently 2 or more standard deviations above the mean.)

Comments on Wipe Sampling (CPSC Protocol):

(1) The protocol is designed to produce a consistent set of numbers; unfortunately, how these numbers would relate to actual hand-loading or exposure is not clear. The use of "wet rubbing" will tend to maximize the amount of materials taken from the wood.

It is our observation that the actual areas of playground equipment contacted by children's hands are frequently worn very smooth and/or are constantly inspected for roughness, which is corrected in maintenance. The places that the samples are likely to be taken in the stated protocol are likely to be abnormally rough and seldom touched by children. We recommend that the bio-available hand-loadings from relevant parts of the equipment be determined by pre-washing the hands of adult volunteers. These hands of the adult volunteers would then be rinsed (with *e.g.*, 100-mL of distilled water) to obtain a background concentration. The adults would then simulate play on the equipment for (*e.g.*, 30 minutes), the hands of the adults would then be rinsed three times successively (with *e.g.*, 100-mL of distilled water). The combined rinsates (and in some cases the individual sequential rinsates) would then be analyzed for (bio-available) pesticide residues.

It is believed wet/dry conditions will be a significant variable in hand-loadings. If the equipment is dry during the simulated play described above, the hand contact areas should be wet and the procedure repeated.

(2) At each playground, children should be observed for the frequency and area (*i.e.*, extent) of hand-mouthing. Ideally, the children would be observed without their knowledge and then they or their caregiver could be surveyed to determine the frequency and duration of playground use and the children's ages. This would probably best be done before sampling at the playground to help identify the child-assessable surfaces and areas that need to be sampled.

(3) It would be interesting for the CPSC to do a series of parallel experiments using the following matrix:

Dry/No-rubbing (just press dry hands onto dry wood)	Dry/Rubbing (rub dry hands on dry wood)
Wet/No-rubbing (just press wet hands on wet wood)	Wet/Rubbing (rub wet hands on wet wood)

These data would shed some light on the nature of surface-to-hand transport, which would be useful for designing mitigation strategies. For example, rubbing is likely to cause micro-fibers of wood to be ground off as well as deposits of "dislodgeable preservative residue"). The proposed protocol of sliding a weight over a stationary sheet of wet material unrealistically combines these elements (wet/dry and rubbing/no-rubbing) and is not readily comparable to the rubbing or non-rubbing condition (*e.g.*, although the material is nominally stationary, there will be some motion of the material parallel, perpendicular and out of the plane of the moving weight).

It is suggested that samples obtained from pressing and rubbing be subjected to microscopic examination (light and XRF) to determine what the nature of transferred material is (non-wood particles? wood fibers? liquid solution?). This information is valuable in devising mitigation strategies and assessing bioavailability of the residues (especially in terms of dermal absorption).

Comments on Arsenic and Chromium Speciation:

(1) We suspect that a significant amount of arsenic on the surface of the wood and especially in the soil will be in the form of methylarsenic compounds (with low toxicity). We suggest that at least some samples be analyzed for "total arsenic", iAs(III), iAs(V), MMA(V) and DMA(V). We would expect any algae on the wood or soil/buffer to collect and methylate arsenic from the wood converting it to form (non-toxic) arsenosugars as found in marine algae[1]. We also expect that iAs(V) in particular will be in the form of nearly insoluble compounds with Fe(III), Cr(III), Ca(II) etc. The form of arsenic and its

[1]Levels of arsenic in marine algae are typically over 10,000 μg/kg (ppb) and have been found over 100,000 μg/kg. Lai *et al.* 1997. The characterization of arsenosugars in commercially available algal products including a *Nostoc* species of terrestrial origin, *Appl Organometal Chem* 11(10-11): 797-803.

solubility obviously bears on the issue of bioavailability and especially dermal absorption.

(2) We note that the chromium in CCA-preserved wood is normally Cr(III) when the wood is in service. Excess reducing agents in the wood likely ensure that this is the case through the lifetime of the product. However, application of powerful oxidizing agents especially at high pH may transiently allow the Cr(III) to convert to Cr(VI), which is more soluble/mobile. The oxidizing agent that is applied (*e.g.*, bleach) is itself a toxic and environmentally undesirable material; and while it is present in active form, the traces of Cr(VI) possibly formed from the wood are of no significance. If traces of Cr(VI) are formed and transported to the soil by bleach-type agents, they will be converted back to Cr(III) in the soil when the bleach is neutralized. Regardless, note that the action of bleach is only on the surface of the wood.

Chromium is an essential trace element (which is deficient in many diets) and its normal uptake by plants probably depends on the equilibrium between inert Cr(III) and mobile Cr(VI) in soil. Thus, the presence of traces of bioavailable Cr(VI) in soil is normal and probably desirable.

CCA Public Comment 4

AMERICAN CHEMISTRY COUNCIL
ARSENICAL WOOD PRESERVATIVES TASK FORCE

COMMENTS ON:

Environmental Protection Agency draft protocol
Sampling for Residues of Arsenic, Chromium and Copper in Substrates (Soils/Buffering Materials) Adjacent to Chromated Copper Arsenate (CCA)-Treated Playground Equipment

and

US Consumer Product Protection Agency draft protocol
Sampling Chromated Copper Arsenate (CCA) "Pressure" Treated Wood Playground Equipment for Dislodgeable Residues of Arsenic, Chromium and Copper

Contact Information
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ENVIRONMENTAL PROTECTION AGENCY DRAFT PROTOCOL

1.0) In general, EPA may have underestimated the extent of "buffering" that is used near play structures in public or institutional playgrounds. The agency is planning on collecting equal numbers of soil and "buffer" samples but analyzing only a portion of the nonsoil samples. The agency indicates that they expect the possibility of collecting fewer "buffer" samples than planned. It is likely that the agency may find the opposite to be the case, and may want to consider adjusting the draft protocol accordingly to accommodate this.

2.0) On page 3, section I. B. a. and page 5 section I. C.a., a sentence should be added to indicate that the preservative mixtures undergo complex fixation reactions within the structure of the wood that minimizes leaching from the treated wood product.

3.0) There does not appear to be a basis for statistical input in the ground surface sampling design suggested in the protocol. Although the number of ground cover samples is large in both the pilot and definitive studies, all of the samples are to be collected directly below a structural member or at a distance of two inches from a ground-contact structure. With these data sets the only comparisons that seem to be possible are: a) range and distribution across playgrounds of metal concentrations two inches from a structure and b) play area concentrations verses control. The sampling plan in the protocol would tell the investigators nothing about how the exposure potential might change with distance away from the play structure (beyond two inches – a site that might represent highest metal values but that is not a representative play area). A better approach to sampling would involve radial sampling away from a ground structure and/or using grids with randomized sampling, or both. These approaches could include the two inch sample point EPA has already identified, as well as other specific areas of interest such as the base of a sliding board or under a swing. By adding dimension to the sampling plan, information can be obtained on metal distribution patterns in the ground cover. This type of information is amenable to more powerful statistical analyses than might be possible with the data set presently outlined in the draft protocol.

4.0) The sampling plan should include more than two control samples per site.

5.0) The sampling protocol should specify the use of plastic sampling devices (scoops, spoons) to avoid interference with chromium analysis.

6.0) Sample analyses should include copper to allow correlation with arsenic and chromium measurements. This will assist in data interpretation by highlighting background arsenic and chromium as well as arsenic and chromium from sources other than CCA-treated wood.

7.0) The agency should consider splitting arsenic samples for determination of total/speciated arsenic and determination of water-soluble arsenic.

8.0) The agency should be aware that use of a stain method for determination of wood treatment may indicate if the wood is treated but will not provide information on treatment retention.

9.0) The sampling protocol does not contain adequate detail on the requirements for analytical method validation and quality control. At a minimum, the specific requirements for the EPA work should meet the requirements of OPPTS Guidelines 875.1100 and 875.1300 for:

analytical method validation including accuracy and precision for each sample matrix,
extraction and recovery of target metals from each matrices,
sample storage stability.

10.0) The protocol does not state how samples will be prepared for analysis. If complete ashing of the samples for compositional analysis is to be the only approach for surface material analyses, then particle size is not a consideration for EPA and the assumption will be that all metals contained on and in playground surface particles are ingested or dermally absorbed, no matter what size. Furthermore, since studies are only available on transfer kinetics of small soil particles from hand-to-mouth and not for larger surface media particles such as those likely to be present where wood chip "buffering" is used, the assumption will be that all playground surface material will behave like very fine soil particles in terms of hand-to-mouth transfer and transdermal absorption. Alternatively, if the agency is interested in obtaining information about metal concentrations on the surface of particles or metal concentrations as a function of particle size, the analytical protocols allow for grinding and forced sieving of soil/sediment samples. However, the EPA sampling protocol does not provide direction for this, and sample particle size is not stipulated in the protocol. If EPA intends to use the ground cover metal concentration data in children's exposure assessment, which the Task Force believes it does, then particle size is an important variable for oral exposure. Most literature on unintentional soil ingestion through hand-to-mouth activity in children, including EPA exposure assessment guidelines, are based studies of soil particles in the size range of 250μ. Since there may be very little playground surface material of this particle size, grinding or forced sieving may grossly overstate exposure potential because particles that children encounter may be far larger than samples ground in the laboratory. There is no literature or experience on sampling techniques, chemical analysis (sample desorption) techniques, or most importantly, residue transfer estimation for any of the possible "buffering" media. All previous work in the field of environmental exposure assessment is based on soil as the contaminated medium and the medium of transfer to humans. How EPA will address the quantitative transfer of playground surface media to oral dosing is not stated in the protocol. The Task Force believes that EPA should state in the protocol the methods by which calculations for contaminated soil uptake and transfer will be related to wood chips or other "buffering".

In any case, the EPA protocol should address how these aspects of sample preparation will be handled and at a minimum how the results of analyses will be reported, i.e., as wet weight per sample or in some other manner.

11.0) The protocol does not state if sampling can be performed during precipitation, or how long after precipitation sampling can commence.

12.0) The agency protocol should indicate the procedure for sampling play areas containing coated play equipment structures.

CONSUMER PRODUCT SAFETY COMMISSION DRAFT PROTOCOL

1.0) Some inconsistencies or imprecision in the protocol language were noted. For example, page 9 and elsewhere the protocol states that "wood samples" will be taken as opposed to "wood wipe samples". Also on page 3 and elsewhere, the term "unfinished lumber" or "specifically finished lumber" are used and no definition of these terms is provided. The terms can refer to whether or not the surface of the wood was planed or unplaned. These should be corrected or clarified.

2.0) On page 3, section I. B. a. and page 5 section I. C.a., a sentence should be added to indicate that the preservative mixtures undergo complex fixation reactions within the structure of the wood that minimizes leaching from the treated wood product.

3.0) The protocol does not indicate whether or not the polyester cloth wipe samples will be cut into small pieces for extraction. If the samples are to be cut (test tube sizes and extraction volume were not stated in the protocol), then chromium-containing, i.e., stainless steel, scissors or knives should not be used.

4.0) The protocol does not state whether or not the Parafilm will be changed after each sampling. The Task Force believes the Parafilm should be changed after each sampling.

5.0) It is not clear that the number of purchased treated wood samples, per region, will be truly representative of all of the wood sold in that region. Instructions should be issued to FO's selecting and purchasing the wood. A copy of the instructions should be attached tot he protocol.

6.0) The protocol does not state if sampling can be performed during precipitation, or how long after precipitation sampling can commence.

7.0) The CPSC protocol should indicate the procedure for sampling play areas containing coated play equipment structures.

8.0) The section of the draft protocol describing sample documentation for playground usage appears to suggest that a questionnaire will be employed to collect the information listed in that section of the protocol, particularly section d. iv., "Known injuries or illnesses of children from use of playground equipment" (page 12). The protocol should state exactly how this information will be collected and what training and direction will be given to the individual collecting information to avoid bias in reporting. If a questionnaire is to be used, a copy of it should be at attached to the protocol.

9.0) There is credible evidence, both analytical and toxicological, that the preservative metals contained in the surface residue on CCA-C treated wood are not dried residue of arsenic acid, chromic acid and copper oxide but are instead predominantly water-insoluble complexes of calcium-arsenic-copper-iron, and that the solid deposits do not contain

arsenic pentoxide or arsenic trioxide[1]. Accordingly, CPSC chemical analyses of playground equipment surface residue should provide for analysis of the preservative metals as they exist in the residue, i.e., in the form that humans are exposed, rather than in a conventional if not convenient means of total elemental metal analysis proposed in the draft protocol. This approach to sample analysis would require a change in the analytical scheme proposed by CPSC protocol and suggests that any method validation that may have been performed with CCA solutions, spiking polyester cloth wipe samples for extraction efficiency, for example, is inappropriate.

10.0) Previous studies of playground equipment surface residue have shown great variability in results. The Task Force believes that one reason for this variability is the lack of standardized protocols for these types of studies and the absence of validated methods for sample collection and analytical characterization. Because the techniques required for this type of research are not well-established (there are no published guidelines for studies of this type), the Task Force feels that prior to any field sample collection, all methods to be employed in the study should be properly validated in the laboratory and following that, validated with field samples. Proper validation should include but not be limited to demonstrations of accuracy and precision in collection and measurement techniques. Method reproducibility and variability should be known and evaluated for acceptability. The methods to be validated should include sample collection, media desorption efficiencies and chemical analysis.

11.0) The draft protocol does not indicate specifics of QA/QC procedures. There is no specific mention of how standards and blanks will be used and how often they will be used. There is no indication of the identity or source of analytical standards.

12.0) The CPSC is proposing cloth wipe sampling to obtain surface residue from treated wood playground equipment. As noted in the draft protocol, this approach has been used before. The draft protocol does not state how the pitfalls of this method will be avoided in the proposed study, i.e., artifactual findings due to fabric interferences due to loss of integrity of the wipe (shredding), and interception of whole wood particles by the wipe. The wood particles, which are not residue and are far too large to be considered in hand-to-mouth transfer calculations, have in some instances been subject to chemical analysis for elemental arsenic thereby causing a gross overestimate of the amount of dislodgeable arsenic on the wood surface. While it is desirable to use a standard force (weight) to collect wipe samples, 1.1Kg may generate splinters and tear the cloth. The protocol should require monitoring for these possibilities and state procedures to be taken if either or both of these occur.

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[1] See comments of the American Chemistry Council Biocides Panel Arsenical Wood Preservatives Task Force and the American Wood Preservers Institute, "Petition HP01-3, Petition for Ban on the Use of CCA Treated Wood in Playground Equipment", September 11, 2001.

Stevenson, Todd A.

From: Has_Shah@americanchemistry.com
Sent: Monday, October 22, 2001 5:19 PM
To: cpsc-os@cpsc.gov; Bittner, Patricia; opp-docket@epa.gov; Welch.Connie@epa.Gov; Cook.Norm@EPAMAIL.EPA.GOV
Subject: Revised Comments of American Chemistry Council on CPSC/EPA Playground Study Draft Protocols

Comments on CPCS and EPA Playg...

REVISED COMMENTS

American Chemistry Council's revised comments on EPA and CPSC draft protocols are attached. Please discard the previous comments that I sent you at 3:58 p.m. today. Please refer to following captions in docketing these comments:

CPSC: Notice of Availability of Draft Dislodgeable Residues Protocol.

EPA: Docket Number OPP - 00741.

(See attached file: Comments on CPCS and EPA Playground Study Draft Protocols 10-22-01.doc)

Has Shah
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